DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mike Savage on 03/27/2009.

The claims have been amended as follows:

29. (Currently amended) A tunable microwave arrangement, comprising: a microwave circuit device, a substrate, and a layered ground plane structure disposed between the microwave circuit device and the substrate, wherein the layered ground plane structure comprises ~~at least one~~ a plurality of patterned first metal layers, ~~at least one~~ a plurality of second metal layers, and ~~at least one~~ a plurality of tunable ferroelectric film layers between the ~~at least one~~ plurality of patterned first metal layers and the ~~at least one~~ plurality of second metal layers; and the layered ground plane structure comprises a multilayer structure having more than one ferroelectric film layer, each ferroelectric film layer being disposed between respective first and second metal layers.

30. (Previously presented) The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of patterned first metal layers comprises a patterned electromagnetic band gap crystal structure.

31. (Currently amended) The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of tunable ferroelectric film layers is patterned.

32. (Currently amended) The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of ferroelectric film layers is not patterned.

33. (Currently amended) The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of second metal layers is not patterned.

34. (Currently amended) The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of second metal layers is patterned.

35. (Currently amended) The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of second metal layers comprises platinum, copper, silver, or gold.

36. (Currently amended)The tunable microwave arrangement of claim 29, wherein the ~~at least one~~ plurality of tunable ferroelectric film layers comprises strontium titanate (SrTiO3) or barium strontium titanate (BaxSrl_xTiO3).

37. (Currently amended) The arrangement of claim 29, wherein the layered ground plane structure is tunable in response to a DC voltage applied between the ~~at least one~~

plurality of patterned first metal layers and the ~~at least one~~ plurality of second metal layers.

39. (Currently amended) The arrangement of claim 37, wherein the applied DC voltage affects a dielectric constant of the ~~at least one~~ plurality of patterned first metal layers, thereby changing an impedance of a surface of the layered ground plane structure adjacent the microwave circuit device.

50. (Currently amended) The arrangement of claim 29, wherein the ~~at least one~~ plurality of tunable ferroelectric film layers has a thickness of about 1-2 micrometers.

53. (Currently amended) A method of tuning a microwave arrangement comprising a microwave circuit device, a substrate, and a layered ground plane structure disposed between the microwave circuit device and the substrate, the method comprising the steps of applying a DC tuning voltage between a first patterned metal layer and a second metal layer ~~disposed on opposite sides of a ferroelectric layer~~, wherein the layered ground plane structure ~~comprises the layers and~~ is a multilayered ground plane structure comprising more than two ferroelectric film layers, and selecting any of the first and second metal layers surrounding any of the ferroelectric films for tuning the microwave/integrated circuit device.

Allowable Subject Matter

1. Claims 29-51 & 53-55 are allowed.

2. The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach the layered ground plane structure comprising a multilayer structure having more than one ferroelectric film layer, each ferroelectric film layer being disposed between respective first and second metal layers. However, both of the newly cited prior art references, Wilkborg et al (e.g. fig. 6) & Lee et al (e.g. fig. 1), teach having a multilayer ferroelectric section. The distinguishing feature between the prior art and the current application is that the prior art teaches having interleaved ferroelectric and substrate/dielectric buffer layers while the current application (e.g. fig. 6) teaches having interleaved metal and ferroelectric layers.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GERALD STEVENS whose telephone number is (571)270-5076. The examiner can normally be reached on Mon-Fri 7:30am - 5:00pm EST alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 571-272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BENNY LEE/
PRIMARY EXAMINER
ART UNIT 2817

GDS